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The Soviet–East European Military and Defense-Industrial Relationship

Perspective: East European Military Modernization Falters Despite Increased Soviet Control

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Since 1955 the USSR has greatly tightened its control over the military planning and the defense-industrial institutions of the Warsaw Pact. Nonetheless, the self-defeating defense-industrial policies that it imposed on the Pact during the 1970s and the poor East European economic performance in general have combined to create a widening gap between the military capabilities of Soviet forces and those of their Pact allies

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Increasing Soviet Control

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Since the creation of the Warsaw Pact in 1955, the USSR has manipulated the military and defense-industrial planning institutions of the alliance

Increasing Soviet control in the late 1960s coincided with a marked change in the missions of NSWP forces, which began to be assigned key offensive roles against frontline NATO forces. Previously these forces had been little more than internal defense forces with almost no direct responsibility for offensive operations.

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The more demanding offensive missions of the NSWP countries highlighted serious deficiencies in their capabilities, however, prompting a Soviet-inspired program to modernize armaments and to ease maintenance and logistics by standardizing major systems in all Pact forces. The Technical Committee of the Soviet-controlled Combined Armed Forces (CAF) was

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created in 1969 to spearhead this drive, and Soviet-style planning procedures—centered on five-year defense plans—were instituted in all Pact countries. Coordination of industrial plans to meet this defense goal was centralized in a Soviet-chaired Permanent Commission on the Defense Industry of the Council for Mutual Economic Assistance (CEMA). (See "Integration of Defense-Industrial Planning in the Warsaw Pact.")

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Integration of CEMA defense industries was increased substantially in the 1970s to support the Pact-wide modernization drive. The generally superior Soviet weapons were made the Pact standard, and NSWP countries (except Romania) cut back their indigenous weapon development efforts. NSWP forces began procuring newer systems manufactured in the USSR—such as aircraft—or older systems made in their own plants under Soviet license—notably armored vehicles and artillery. The licensing arrangements have shifted the production of older systems to the NSWP countries, enabling Soviet industry to move on to newer generations of weapons, while Moscow retains control of NSWP developments in military technology. The Soviets also retain considerable control over the terms of weapons trade within the Pact and over NSWP exports to the Third World. (See "Integration of Warsaw Pact Weapons Production.")

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As a consequence of Soviet policies, the indigenous weapon design and fabrication capabilities of the East European countries have stagnated and their arms industries are tending to concentrate on producing support systems, small arms, ammunition, and components. This specialization stems in part from Soviet war plans, which call for sources of spares and ammunition to be located close to deployed forces, while critical weapon assembly facilities are kept in the less vulnerable Soviet interior. Specialization also satisfied the Soviet desire to realize economies from long production runs and to increase Pact interdependence through expanded trade. The benefits, however, have been offset somewhat by disruptions in certain major weapon production programs due to the Soviets' cumbersome management procedures and to frequent shortages of weapon components.

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The East Europeans also have been enlisted in Soviet efforts to advance the Pact's capabilities in critical emerging technologies that have a wide variety of military and industrial applications. The specialization engendered by these programs is illustrated by Bulgaria's role in the CEMA program to develop an indigenous computer series—the Ryad. The program has advanced national development rapidly and has served as a conduit for the inflow of Western technology but has also created interdependence and attendant program disruptions. Moreover, the Soviets

rely more on the East Europeans in basic supporting industries like computers than they do in armaments. (See "Integration of Warsaw Pact High-Technology Industry: The Bulgarian Role in the Ryad Computer Program.") [redacted] 25X1

On the whole, the Soviets probably judge that they have reaped important benefits from their increased control over defense planning in the NSWP countries. Clearly, the other Pact countries' military capabilities have advanced since the modernization program began in the late 1960s. Moreover, the Soviets have been able to shift the NSWP military posture toward offensive operations against NATO and away from development of independent self-defense forces. [redacted] 25X1

Diverging Capabilities

The core problem for the Soviets is that, despite their success in extending control over NSWP armaments procurement and production establishments, the gap in military capabilities between their own and the NSWP forces has widened. During the preparation of each five-year plan, the East Europeans succeeded in scaling down Moscow's initial ambitious plans to modernize their forces; and later, for the most part, they failed to meet even the reduced objectives. Economic problems have prevented most Pact countries from buying the agreed quantities of increasingly expensive Soviet weapons. Economic problems have also contributed to political and social strains, which have further disrupted the defense industries in some East European countries. Poland is a prime example. Indeed, the interdependence urged by the Soviets since 1969 has exacerbated the core problem, as disruptions in one country's industry ripple throughout the Pact. [redacted] 25X1

In ground and air forces, the gap in capabilities between Soviet and NSWP units has widened dramatically as Soviet forces receive the more effective new weapons long before the NSWP forces do. In the late 1970s the East Europeans agreed to a goal of achieving then-current Soviet levels of ground forces organization and equipment by the mid-1980s. Their capabilities have in fact improved since then, but no NSWP country will meet those levels by 1985 and few will do so by 1990. [redacted] 25X1

The difference in the air forces' capabilities is being exacerbated by the East Europeans' recent tendency—mainly for economic reasons—to buy modernized versions of 20-year-old aircraft rather than the more capable models that are entering service with Soviet forces. The growing disparity between Soviet and East European forces, as well as disparities among the East Europeans themselves, will frustrate Soviet efforts to achieve common Pact standards for logistics, training, and tactics—efforts intended particularly to support the more complex combined arms operations that the

Soviets expect to employ during a conflict with NATO. (See "Lagging Modernization of East European Ground Forces: Implications for Warsaw Pact Operations" and "Soviet and East European Air Forces: Comparisons in Combat Potential.") 25X1

Overall, chronic NSWP failure to meet Pact armaments objectives must be a source of continuing concern to Soviet military leaders. They may even consider that it could be undermining the impressive gains they have made in modernizing their own forces over the past decade. As most NATO forces continue to modernize, Soviet concerns may grow through the 1980s. 25X1

We do not know how the Soviets weigh the benefits and the shortcomings of their control of the Pact's defense programs. The benefits were mainly achieved between the mid-1960s and the mid-1970s, when Moscow was increasing the planned NSWP contribution to Pact military operations. With this accomplished, the Soviets then focused their efforts on achieving force improvements through modernization. In this, their approach appears to have fundamental flaws that have prevented attainment of their long-term objectives. 25X1

The Soviets seem to have only three clear-cut alternatives for remedying the situation:

- To foot much more of the East European defense bill, either directly or through highly subsidized procurement arrangements. We believe this would be economically unattractive and would run counter to recent Soviet initiatives in civilian trade (where they have been shifting the terms in their favor).

- To give the East Europeans a larger stake in the production of the sophisticated weapons required to meet the modernization goals. This would reverse Soviet efforts to monopolize production of the most advanced weapons. It would also oblige Moscow to invest heavily in upgrading NSWP weapon manufacturing technology and industrial plants and eventually to license sensitive weapon designs. Even if the decision were made today, at least five years would probably elapse before NSWP countries could begin production of the more advanced systems.

- To relieve the NSWP forces of responsibility for significant portions of their wartime missions. The Soviets would be unlikely to do this without increasing their own military presence in Eastern Europe, however; and that would entail military and political costs as well as increased economic costs.

None of these alternatives is likely to be attractive. [redacted] 25X1

On balance, we believe the Soviets will continue their course of making piecemeal ad hoc arrangements to compensate only for the most glaring NSWP deficiencies. They already have substantially increased their logistics base in East Germany, thereby lessening their dependence on Polish lines of communications from the USSR. In addition, they might adjust their war plans to allow for a larger, earlier commitment of USSR-based forces to operations against Greece and Turkey in place of Romanian and some Bulgarian forces. If Moscow pursues the piecemeal course, we judge that the disparity between Soviet and East European capabilities is likely to continue widening. [redacted] 25X1

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Soviet Dominance of the Warsaw Pact: Implications for Peacetime Policies and Wartime Control

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The Warsaw Pact's public posture is that of a military alliance of sovereign nations, joined together for common defense. In fact, it is an instrument of Soviet control over East European defense policies and armed forces.[1] In the Soviets' view, all political, social, and economic aspects of preparing each of the Warsaw Pact states for war fall under the category of defense or armaments planning and thus are subject to direction by the coalition—which they dominate. War plans, drawn up by the Soviets for all Warsaw Pact forces, define the strength and structure of those forces, direct production of weapons and military equipment, guide development of transportation and communication networks within the member states, and influence general economic strategy—especially for defense industries.

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Outlook

With the wartime structure defined to their liking, the Soviets probably are satisfied with their legal authority over the Warsaw Pact. Because the adoption of the new statute affected only the control of wartime operations, we also can infer that Moscow feels its influence already is so strong that no major revisions to the 1969 Peacetime Statute are needed. Even without revising their legal authority, however, the Soviets have consistently worked to expand their involvement in areas that had been strictly national defense matters. We expect the trend of increasing control to continue—particularly regarding communications and logistics—while the East Europeans resist Soviet inroads with varying degrees of success. The Soviets have shown no inclination to activate the Western and Southwestern Theater High Commands in peacetime, but the permanent establishment of these bodies remains an option that could further tighten Soviet dominance.

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Integration of Defense-Industrial Planning in the Warsaw Pact

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Since 1969 the Soviets have gradually increased their control over the armaments acquisition planning process of their Warsaw Pact allies. One of their principal instruments of control has been the five-year defense plan, drafted by the Staff and Technical Committee of the Warsaw Pact Combined Command and coordinated by the Permanent Commission on the Defense Industry of the Council for Mutual Economic Assistance (CEMA). Despite the elaborate mechanism for Warsaw Pact weapons planning, however, the Soviets still have difficulty obtaining the full cooperation of their allies.

Evolution of Soviet Control

After World War II the Soviets guided the restoration of the East European industrial infrastructure, emphasizing the creation of production capabilities for small arms and other military equipment. To increase their control over military production, they established procurement and industrial bureaucracies that closely resembled their own in each of the East European nations. The formula was apparently successful. According to a Western author, a Polish military attache to the United States reported that in the late 1950s the Soviet General Staff decided such questions as how many tanks the Czechs would produce, how many guns and planes the Poles would build, how many trucks the Hungarians had to provide, and which army would get them.

Despite the USSR's high degree of control over the armaments production of its allies, agreements were handled primarily on an informal bilateral basis. This continued despite the creation of CEMA in 1949 and even after the formal establishment of the Warsaw Pact in May 1955.

The ambiguous lines of authority for armaments planning initially provided the Pact with a semblance of equality and equanimity, but in time the Soviets found that this ambiguity did not meet their needs.

Specialization of production responsibility, standardization of weapons, and an integrated armaments base were difficult to plan without a multilateral negotiating arrangement. 25X1

The military developmental planning system in effect today was established in the early 1970s, primarily on the basis of the March 1969 Peacetime Statute.[1] This system is highly centralized and is modeled after the Soviets' own organization for military developmental planning. Organization and procedures for weapons procurement within CEMA were also developed in the early 1970s and made an integral part of the overall armaments planning process. 25X1 25X1 25X1

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[1] Ratified by the Warsaw Pact nations at a meeting of the Political Consultative Commission on 17 March 1969, the document known as the Peacetime Statute formally created the administrative structure of the Warsaw Pact. 25X1

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meeting in Moscow agreed to draw up a "Complex Program for the Further Deepening and Improvement of Cooperation and the Development of Socialist Economic Integration Among CEMA Countries." This program was adopted in Bucharest in 1971.

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CEMA decisions appear to parallel and substantiate those of the Warsaw Pact. Thus, in 1969, the year the Peacetime Statute was adopted, the CEMA Council

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extend Soviet control throughout the defense industries of its East European allies. Such control is intended to facilitate Soviet efforts to force the upgrading of NSWP armed forces. It also serves as part of a broader attempt to enhance the USSR's political and economic control over Eastern Europe.

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In the economic sphere, the armaments planning process has facilitated Soviet influence over the directions of development and operations of the NSWP defense-related industries. Coordinated planning has made it possible to achieve a more efficient specialization of production responsibility among the different nations and to implement numerous cooperative production arrangements. Such arrangements are representative of the overall Soviet drive toward "socialist economic integration." The interdependence engendered by CEMA economic integration has the added effect of limiting the independence of NSWP decisionmakers regarding the level of defense spending, types of arms production, and the development of their industrial base.

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Their central role in the planning process has also made it easier for the Soviets to implement what they call a "unified military-technical policy." This policy, which involves the standardization of the Warsaw Pact weapons base in terms of inventory, logistics, and technical specifications, allows the Soviets to

Implications

Since 1969 the USSR has used the centralized Warsaw Pact armaments planning process as a means to

influence both the size and the quality of NSWP arsenals. The policy also creates an interdependence of Pact members in terms of supply and logistics that could act as a restraint upon independent military endeavors. [redacted] 25X1

Despite the Soviets' success in developing instruments of control, economic conditions have tempered the achievement of desired results. Soviet control has failed to guarantee the fulfillment of armaments procurement plans, and this failure has retarded the rate of improvement in NSWP forces. Soviet-controlled planning has not overcome problems of coordination on the ministerial and enterprise levels. Nor has it alleviated shortages of spare parts, skilled labor, and productivity incentives, which still plague NSWP defense-industrial production. [redacted] 25X1

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Integration of Warsaw Pact Weapons Production

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Introduction

Since the 1950s the defense industries of the non-Soviet members of the Warsaw Pact (NSWP)—except Romania—have generally become more specialized, emphasizing production of support systems, parts, and a narrow range of weapons. Soviet designs generally have replaced indigenous designs for weapons in NSWP defense plants, often long after the weapon first entered production in the USSR. These practices have increased industrial integration in the Pact, technical dependence on the Soviets, and standardization in Pact military forces. These, in turn, have enhanced Soviet military and economic control.

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Production Patterns

Defense industries in the other Pact countries vary considerably in size, and collectively they are smaller than the Soviet defense industry. The largest weapon system producers are Czechoslovakia and Poland, which have decades of experience in weapons engineering and production. The Czechoslovaks concentrate on land arms and some aircraft, while the Poles manufacture an array of land, air, and naval systems. Hungary and Bulgaria produce smaller amounts of predominantly land arms, but both have growing industries. East Germany produces only a few major weapon systems, in part because of Soviet reluctance to see a major defense industry develop in that country. The rapidly growing Romanian defense industry is characterized by a streak of independence. In addition to maintaining Soviet ties, the Romanians have secured Chinese and West European designs, produced Western helicopters under license, and begun construction of surface combatants of their own design. The table illustrates selected NSWP production of major weapon systems.

NSWP defense industries produce a variety of major support systems, including vehicles, naval auxiliary ships, trainer aircraft, and ammunition and small arms. In addition, NSWP electronics and machine-building industries produce an array of weapon components and assemblies ranging from electronic systems to tank tracks. In such areas as optics and microelectronic production equipment and devices, NSWP capabilities—though not on a scale comparable to those of the Soviets or the West—are among the best in the world. NSWP countries are more important sources of support systems and components than of complete weapon systems.

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Within the Pact, trade in major weapon systems is mostly one way. NSWP forces increasingly supplement the products of domestic industry with large-scale procurement from Soviet sources, mainly sophisticated weapons like advanced fighter aircraft, surface combatants, missiles, and radar. Only in recent years has the NSWP supplied the Soviets with major combat systems—the BMP infantry fighting vehicle (IFV), the MTLB prime mover

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The active Third World arms market provides a ready source of hard currency for both Soviet and NSWP producers. Estimated East European gray arms sales (mostly small arms and ammunition) in 1983 totaled about $100 million.[1] The low technical requirements of some Third World countries are particularly advantageous for NSWP producers. For example, an NSWP export item popular with world arms dealers is the SA-7 shoulder-fired surface-to-air missile—an advanced weapon in Third World inventories. Exports of the 1950s-vintage T-55 tank have earned considerable hard currency, particularly in the Middle East.

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The NSWP would probably sell more arms to Third World countries if not constrained by Soviet licensing restrictions and by intra-Pact commitments to improve forces.

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Land Arms. Land arms dominate NSWP weapons production. The NSWP has 20 assembly plants for major land arms weapon systems, 14 of them in Czechoslovakia, Poland, and Romania; for producing the same types of systems, the Soviet Union has 20 plants, most with greater capacity. Land arms produced in the NSWP tend to be relatively less sophisticated and easy to manufacture, often licensed out by Moscow near the end of their production runs in the USSR. This releases production capacity the Soviets require for their newest systems, while providing a continued source of spare parts for fielded systems. The recent introduction of a large number of Soviet systems into NSWP production, combined with historically long production runs in all these countries, suggests that the current models of land arms will generally continue in production through much of the 1980s.

Land arms production illustrates both the major changeover to Soviet systems and the technical deficiencies in the NSWP industrial base:

- NSWP countries have produced Soviet-designed tanks since the 1950s, using facilities partly equipped and supported by the Soviets. While Soviet tank technology progressed from the T-55 to the T-62, T-72, T-64, and T-80 (and a modernization of the T-55s and T-62s), the Poles and Czechoslovaks continued production of the T-55. The NSWP countries can be expected to modernize their T-55s even as they begin to produce the T-72. The limitations of NSWP manufacturing technology are evident in the difficult Polish and Czechoslovak transition from the T-55 to the T-72

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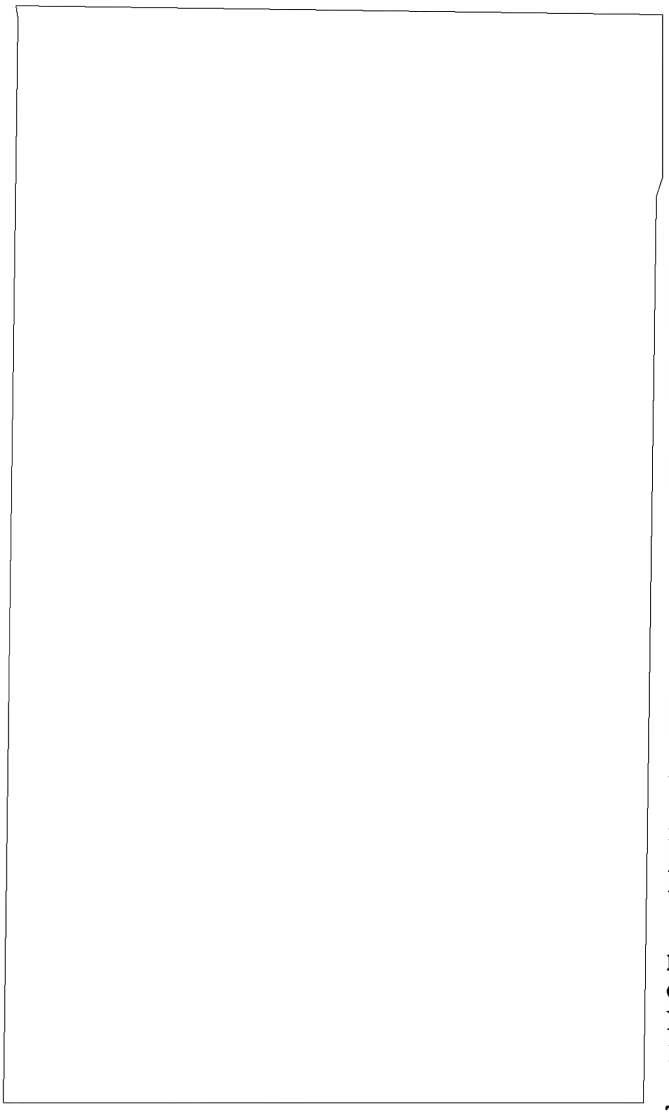

- APCs and IFVs offer the best illustration of the changeover from locally designed to Soviet-designed systems. The only indigenous systems still in production are small reconnaissance vehicles.

- NSWP artillery producers converted from towed to self-propelled systems about seven years after the Soviets did, and they generally adopted Soviet designs. The Czechoslovak-designed DANA 152-mm self-propelled wheeled howitzer is the only indigenous major weapon system in production. Manufacturing problems delayed its entry into serial production, and it still has nagging technical problems. As the Czechoslovaks look for buyers, the Soviets will probably be encouraging one or more other Pact countries to produce the Soviet self-propelled howitzer. Should they succeed, the competition will probably be too great for Czechoslovakia. 25X1

The NSWP support equipment industry has a fully developed production base and qualitatively is competitive with the Soviet industry. All NSWP countries produce trucks for the military except Hungary (which maintains the capability of doing so). Czechoslovakia is the leading producer of heavy trucks and a major producer of engineering and construction equipment. Romania, East Germany, and Poland similarly are important producers of vehicles and related support equipment. 25X1

Aircraft. NSWP aircraft production is concentrated in two Polish, one Czechoslovak, and three Romanian plants, none of which produce advanced combat systems. (The USSR has 22 airframe production facilities, many of which build high-performance aircraft.) Of those built for military service, the 1940s-vintage AN-2 transport and the 1960s-vintage MI-2 helicopter and L-39 trainer are produced in the largest numbers. The Soviets claim that the Soviet-designed AN-28 transport and the Soviet-derived W-3 helicopter will enter production in Eastern Europe in the late 1980s, replacing the AN-2 and augmenting MI-2 production. This suggests that there will be little change in the size, basic orientation, and output of the NSWP military aircraft industry at least through 1990. 25X1

The aircraft industry is a particularly pointed example of the decline in NSWP competitiveness in major weapon systems. Until the early 1960s, Poland and Czechoslovakia built Mikoyan fighters—more than 3,500. By the 1970s, however, the USSR had become the sole producer of the fighters being used to modernize NSWP air forces—the MIG-23, MIG-25, and SU-20. This change probably reflects a combination of the limitations of NSWP manufacturing technology, the substantial investment in plant and equipment that would have been required, and Soviet reluctance to license the advanced technology. 25X1

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NSWP difficulty in remaining competitive in military aircraft is illustrated by an ill-fated project undertaken by Romania and Yugoslavia to develop and produce a new ground attack aircraft.

NSWP military aircraft industries have in effect become an adjunct to the Soviet industry. The leverage afforded the Soviets is illustrated by the history of the Soviet-designed MI-2 helicopter (see inset).

Ships. One shipyard in Romania and one in East Germany manufacture major naval combatants, and several other NSWP yards produce minor warships and auxiliary ships. (The Soviets have 11 shipyards producing major surface combatants or submarines and 10 producing other naval ships.) Except for the East German Parchim-class corvette, all major combatants supplied to NSWP navies are designed and built in the USSR. The Romanians, however, are building a destroyer and frigate of their own design.

The Poles produce a relatively large number of auxiliary ships, particularly large amphibious ships, like the Ropucha LSTs and Polnocny LSMs built at Gdansk. By ordering these types of ships from Polish yards, the Soviets free their own to produce more sophisticated warships. They ensure compliance to Soviet specifications by closely monitoring Polish performance

Financial losses and Soviet construction controls impair the Poles' ability to fund the capital improvements needed if they are to be competitive in world markets—or even to fully meet Soviet design and manufacturing specifications. In fact, some ships built in Poland for the Soviets are outfitted elsewhere.

Soviet Control of the NSWP Aircraft Industry: The Swidnik Case

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The Polish WSK-Swidnik factory, currently the only NSWP facility manufacturing a Soviet-designed helicopter, has been producing the MI-2 for almost 20 years.

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The Soviets have been able to give up MI-2 production, modernize their plants for newer helicopters, and rely on the increasingly antiquated Polish plant to supply their requirements for this simple system.

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Inadequate investment in the Polish production base also strengthens the Soviet hand by frustrating development of Western commercial relations. During the 1970s the Poles wanted to export the MI-2 to earn hard currency.

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Consequences

Since the 1950s the Soviets have increased their control—official and de facto—over NSWP defense industry. Supervised by the Pact's Technical Committee and CEMA's Permanent Commission on Defense Industry, the reshaping of NSWP industry proceeded especially rapidly in the 1970s in accordance with plans to modernize and standardize Pact forces. Soviet-designed weapons—generally superior in quality to and more numerous than NSWP weapons—typically have become the standard.

Consequently, individual NSWP defense industries have tended to become more specialized and more dependent on other Pact countries as suppliers and as markets for finished products. Additionally:

- The industries' weapon system development capabilities probably have declined as NSWP designs have been phased out in favor of obsolescent Soviet weapons. Moreover, Soviet and Soviet-controlled Pact organizations closely monitor NSWP military research and development and (except for selected land arms systems) maintain a generally unbalanced flow of technical information from the NSWP to the Soviets on emerging programs.

- NSWP defense industry has increased its concentration on support systems, small arms, munitions, and weapon components. The Soviets decline to license sophisticated systems. This eases the demands on NSWP industry and lessens the opportunity for leakage of sensitive Soviet technology. NSWP component production, in turn, can benefit from the inflow of Western technology. NSWP concentration on support systems also reduces Soviet dependence on militarily vulnerable NSWP plants for critical weapons and enables Pact rear services to draw on local sources for parts.

- Specialization in components probably has contributed to wider participation in production programs for major weapons like the T-72. This affords opportunities for realizing economies with long production runs. It also renders programs more vulnerable to disruption and stresses cumbersome Pact and CEMA procedures for establishing mutual obligations.

- Specialization has increased individual country dependency on intra-Pact trade. The Soviets' dominance over this trade—as the sole supplier of many systems and subsystems the NSWP requires to meet modernization goals and the major consumer of the production of several NSWP plants—affords them considerable leverage over prices and investment.

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Whether the growing Soviet control over NSWP defense industry has been to the overall advantage or disadvantage of NSWP countries is not clear. Militarily, standardization on Soviet armaments probably has increased NSWP military capabilities, although it probably has increased Soviet ability to control operations. Economically, Pact countries probably benefit from the efficiencies associated with specialization 25X1
and the opportunities to earn hard currency through arms exports. Technical dependence on the Soviets may impair development of NSWP industries, however, and NSWP economies remain vulnerable to Soviet 25X1
influence over the terms of trade, as the Soviets charge heavily for licensing and export rights. 25X1

Outlook

We believe the integration of Warsaw Pact defense industries will continue. NSWP specialization in subsystem and component production and reliance on Soviet designs will probably intensify in the 1980s. In open-source literature, CEMA industrial planners extol the 1970s as a period of coproduction and the 1980s as a period of perfecting the mutual advantage. This trend will increase the interdependence of all Pact countries, and it may increasingly involve Romania, which strove for greater industrial independence in the 1970s. The high cost of independence, combined with limited results, may induce the Romanians to turn more to the Soviets for military technology and markets; for example, they have recently produced APCs for the Soviets. 25X1

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The gap between the USSR and the NSWP countries in military systems technology will probably increase, as the Soviets retain production rights to their most sophisticated systems and the NSWP cuts back on indigenous designs. This probably will increase Pact difficulty in assimilating the rapidly advancing military technologies of Soviet and Western origin into weapon systems. However, the high-quality NSWP development and production of microelectronic components and production equipment, limited though it is, probably will aid NSWP efforts to produce some state-of-the-art technology.

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Soviet control over NSWP weapons production probably will increase steadily. Open literature

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indicate that the Soviets have imposed common technical standards and a uniform classification system for military products.

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the Soviets will more closely monitor NSWP export activities to guard against technological leakage and to ensure compliance with license agreements and production standards.

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Integration of Warsaw Pact High-Technology Industry: The Bulgarian Role in the Ryad Computer Program

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The Ryad Project

In December 1967 the Soviets announced a major effort to develop a family of advanced general purpose computers. Although the initial announcement implied it was an exclusively Soviet project, by mid-1968 Moscow had initiated steps to draw in its East European CEMA partners.[1] Soviet writers described the benefits of enlisting technical skills and industrial resources throughout the Bloc and stressed the efficiencies associated with specialization and long production runs. Moscow probably also saw the project as an opportunity to solidify industrial ties through technical interdependence and to exploit the East Europeans' easier access to Western technology.

In 1969 the USSR, Bulgaria, Czechoslovakia, East Germany, Poland, and Hungary officially launched the Ryad (Unified Series) program to develop a family of mainframe computers and associated peripheral equipment and software. The Soviet Union produces the entire range of computers and computer equipment both for the Ryad program and for CEMA's cooperative minicomputer project, but devotes most of its resources to developing large, high-performance mainframe systems. The countries of Eastern Europe concentrate mainly on smaller mainframes and peripheral equipment:

- Bulgaria: External memory devices (disk and tape drives) and small mainframes.
- Czechoslovakia: Small mainframes, minicomputers, and floppy disks.
- East Germany: Midrange mainframes, tape drives, and integrated circuits.
- Hungary: Small mainframes, display terminals, minicomputers, and applications software.
- Poland: Printers and limited numbers of midrange mainframes.

Each CEMA member has some responsibility for software development and the production of electronic components. All Ryad hardware and software is heavily based on IBM technology.

The Ryad program, like other Bloc computer industry projects, is coordinated by CEMA's Intergovernmental Commission for Cooperation of the Socialist Countries in the Field of Computer Technology. It has subdivisions for mainframes, minicomputers, peripherals, standards, services, software, certification, and production assignments. The commission is headed by Yuriy Maslyukov, the first deputy chairman of the Soviet State Planning Committee (Gosplan). Maslyukov also oversees defense industrial planning within Gosplan—a good indication of the importance the Soviets attach to the potential contributions of computer technology to defense-industrial capabilities.

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Bulgaria's Contribution to Ryad

The CEMA integration program has done much to foster growth and raise the technical level of the Bulgarian computer industry. In 1969 Bulgaria had the least developed computer industry in all of East European CEMA. Over the last 15 years, it has become a manufacturer of small computers and computer systems, magnetic disk and tape drives, and associated electronic components and circuits.

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Bulgarians have drawn heavily on Western technology to become Eastern Europe's leading producers of magnetic disk memory devices. For example, they use IBM disk units as models to reverse engineer their own drives. In fact, they still have to rely on imports of Western disk drives to supplement their own production. Bulgaria also has been dependent on the West for magnetic heads, although it now has some indigenous production capability in this area. The Soviets produce many comparable magnetic disk drives, but their products appear to be inferior in quality to the Bulgarians'. Hungary produces some flexible disk units, but otherwise Bulgaria is the only East European country supplying magnetic disk equipment in significant quantities to the Soviet Union and other CEMA countries.

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[1] The Council for Mutual Economic Assistance (CEMA), formed in 1949, includes the USSR, Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, Cuba, Mongolia, and Vietnam.

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Bulgaria's leadership in this production is also attributable to Soviet pressures for specialization. Czechoslovakia and East Germany developed prototype disk units intended for use in Ryad-series equipment, but these units appear to have been dropped, except possibly for some local use

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The Bulgarian Memory Devices Plant

The Memory Devices Plant in Stara Zagora is CEMA's leading producer of magnetic disk units for the Ryad project.

It appears to be the sole East European source of magnetic disk units for Ryad computer systems. It is also a major supplier of disk drives to the Soviet Union

Implications

We believe participation in CEMA projects has enabled the computer industry in Bulgaria to grow more rapidly than it would have under an independent development strategy. Growth has been highly concentrated in one segment of the industry, however, making Bulgarian computer exports and internal computer applications dependent on developments in other CEMA countries—especially the Soviet Union. We believe these conclusions probably apply in general to the computer industries of all the East European countries.

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CEMA countries rely on the Soviets for supply of mainframe computers, and this reliance locks them into associated peripherals and software. East European countries have not yet achieved the level of sophistication necessary to compete for Western markets and do not have the internal demand necessary to support an active computer industry. This enhances the Soviet ability to influence technical and industrial development within CEMA. On the other hand, CEMA computer integration can also lead to Soviet dependence on its East European suppliers, as illustrated by the Bulgarian example.

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We believe Bulgarian problems in producing sufficient quantities of reliable disk drives are an impediment to technological progress in CEMA computer capabilities. Currently, the lack of reliable, high-performance disk drives is one of the most significant deficiencies of computing capability in the Soviet Bloc countries, with ramifications in both industrial and military activities. Reliable, high-capacity disk drives are needed to support the design and use of data base

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management systems, which will be vital to Soviet efforts to introduce into the economy automated control systems for industrial management. On the military side, where large data stores need to be quickly accessed and processed, high-performance disk units could have a significant impact in the areas of troop control, logistics, and communications. [redacted] 25X1

More generally, cumbersome procedures in CEMA coordination and in national central planning hamper responsiveness to a fast-changing technology base.[2] Despite almost 10 years of production experience, Bulgaria has serious quality control and delivery problems, and, at least in disk drives, is slow to move on to new devices. The entire Ryad program reflects this sluggishness—the latest Ryad models are based on IBM 370 designs, introduced in the United States in the early 1970s. [redacted] 25X1

[redacted] 25X1

[2] The Intelligence Community has judged that Soviet Bloc information-processing technologies are not likely to keep pace with Western advances over the next decade. [redacted] 25X1

Lagging Modernization of East European Ground Forces: Implications for Warsaw Pact Operations

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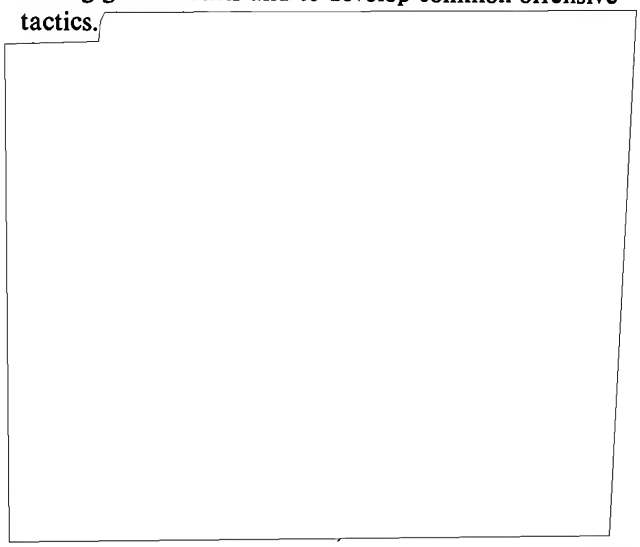
The non-Soviet Warsaw Pact (NSWP) countries assumed significant offensive missions in the Pact's military planning only in the late 1960s and early 1970s. These new missions prompted a rapid buildup in the NSWP ground and air forces, and today 55 of the Pact's 85 ground divisions in Eastern Europe are non-Soviet. These new forces were initially equipped with older—often World War II–vintage—Soviet weapons provided on concessionary terms, and by the early 1970s the NSWP ground forces were already five to 10 years behind the best equipped Soviet forces.

Since the mid-1970s, the NSWP countries have introduced new ground weapons at very slow rates. For example, although all of the NSWP ground forces had acquired some air defense missiles by the late 1970s, only the East Germans have equipped their divisions completely. Antiaircraft artillery (AAA) is still the principal air defense weapon in most NSWP ground units. Also, almost 40 percent of the NSWP motorized rifle regiments (MRRs) are still equipped with trucks rather than armored personnel carriers (APCs) or infantry fighting vehicles (IFVs), and some tank units, particularly in Bulgaria and Romania, are still equipped with World War II–vintage T-34 tanks.

The Soviets have had varying degrees of success in getting their allies to procure new weapons. The East Germans and Czechoslovaks and, more recently, the Hungarians have made major efforts to meet Soviet goals but have still fallen short of them. The Poles, Bulgarians, and Romanians have consistently lagged further behind. The Soviets initially concentrated on upgrading ground forces equipment in East Germany, Poland, and Czechoslovakia. More recently, the emphasis has shifted to encouraging a general modernization of air defense systems in both ground and air forces.

Current Objectives

The Pact's current, Soviet-designed aims are to reduce the disparities in organization and equipment among ground units and to develop common offensive tactics.



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None of the NSWP countries are likely to achieve all of these objectives by 1985, and most are unlikely to meet them by 1990. Economic constraints and production problems will limit modernization in most countries to modest changes. For example, as a result of production problems in Poland and Czechoslovakia, none of the NSWP countries are likely to convert more than two tank regiments to T-72 or modernized T-55 tanks by 1985, and the worst equipped countries, Bulgaria and Romania, are expected to have large numbers of T-34 tanks in their units through the rest of this decade. Similarly, only modest success is expected in replacing trucks in MRRs with APCs or IFVs, and the Poles project that in the mid-1990s most of their artillery will still be of World War II vintage.

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Modernization Rates

NSWP ground divisions usually acquire modern weapons about five years or more after their initial introduction into Soviet forces. Rates of modernization typically involve the introduction of new weapons

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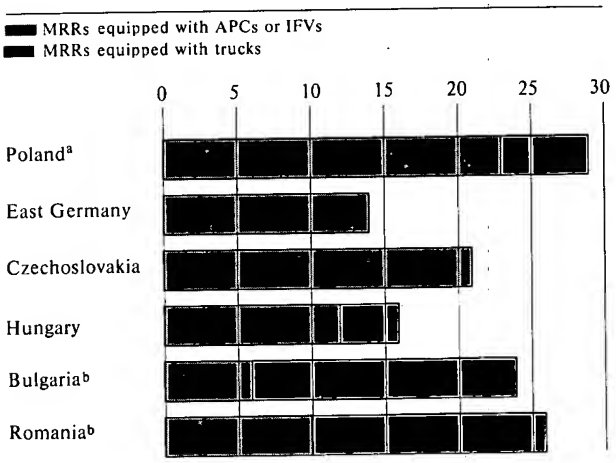
Figure 1
Motorized Rifle Regiments, by Type of Troop Carrier



[a] Poland's airborne and amphibious landing divisions are not included.
[b] Reflects equivalent number of APC-equipped MRRs; Bulgaria and Romania distribute small numbers of APCs in all MRRs rather than concentrate them in a few units.

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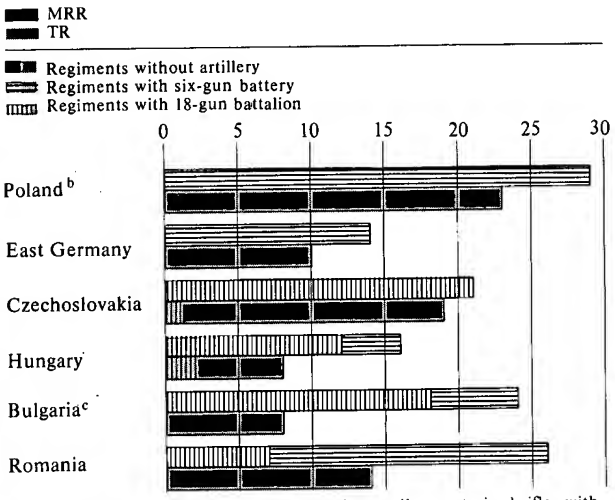
Figure 2
Regiment-Level Artillery[a]



[a] Pact goals are to equip all regiments—tank as well as motorized rifle—with a battalion of 18 guns.
[b] Polish airborne and amphibious landing divisions are not included.
[c] Bulgaria's five tank brigades, which are equipped with artillery battalions, are not included.

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into one to two regiments annually in most countries. (Figures 1 through 4 indicate the extent of modernization and the continuing requirements for new weapons in the NSWP ground forces.) The East European countries apparently have abandoned any hope of meeting current Soviet goals in all weapon categories in the short run and instead are concentrating on correcting the most critical deficiencies—inadequate artillery and obsolete air defenses.

The East Europeans show considerably more enthusiasm for rapid modernization when they produce or coproduce weapons themselves, often under Soviet license. Thus, a combination of economic self-interest and increasing military concern has led to impressive improvements in artillery, where needs can be met primarily from domestic production. Four NSWP countries—Czechoslovakia, Hungary, Bulgaria, and Romania—produce artillery. New production and the redistribution of existing artillery have permitted these countries to expand artillery batteries to battalions in their MRRs. The lack of domestic production in East Germany and Poland, on the other hand, has limited the expansion of artillery units in those countries because of the high costs of acquiring weapons from other Pact suppliers.

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All of the NSWP countries are concentrating on improving their air defenses as the Soviets push for an integrated air defense system covering Central Europe. In the past year all have acquired new SAMs for some ground units or begun construction of new SAM sites for their national air defense forces. The modernization of NSWP air defenses, in ground units as well as in the national air and air defense forces, probably will continue to receive high priority for the rest of this decade. Even the most economically strapped NSWP countries are correcting shortcomings in this area. Ironically, however, the Soviets are about to introduce a new generation of tactical fighters, interceptors, and SAM air defense systems in the next several years that the East Europeans—despite their

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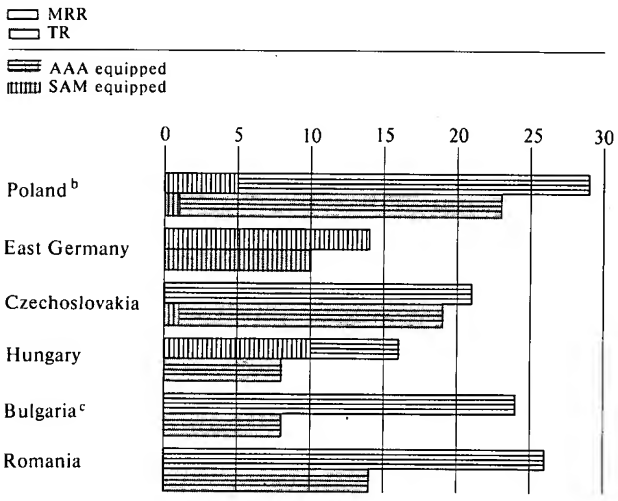
Figure 3
Regiment-Level Air Defenses[a]



[a] Does not include hand-held SAMs such as the SA-7.
[b] Poland's airborne and amphibious landing divisions are not included.
[c] Bulgaria's five tank brigades are not included.

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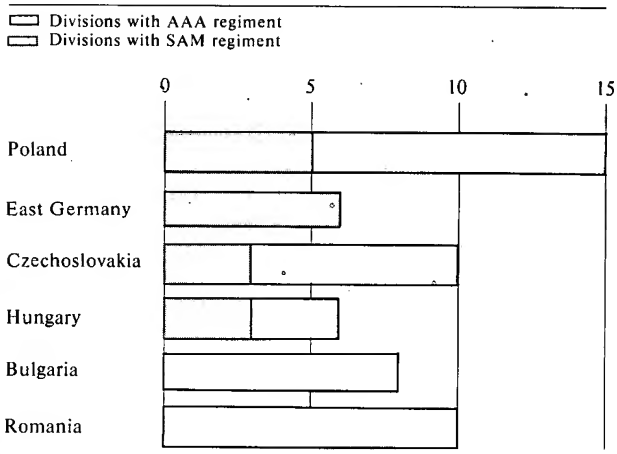
Figure 4
Division-Level Air Defenses



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best efforts—will be unable to match. Thus, large disparities will continue to exist in these areas between the best equipped Soviet forces and their East European counterparts.

Other Shortcomings

The East Europeans are also falling short in manpower, training, and general combat readiness. Some of these shortcomings include:

- *Increasing Reliance on Reservists.* The impact of demographic crises varies among the NSWP countries, but none of them are capable of any major expansion in their ground forces. Those that have expanded the *wartime* size of their ground units to meet Pact goals have not increased peacetime manning but have increased their dependence on reservists to mobilize.

- *Insufficient Training.* Despite Soviet pressure for common standards, considerable variations still exist in the frequency and intensity of training in NSWP ground forces. None of these forces train as intensively as their Soviet counterparts in Eastern Europe. The differences range from minor deficiencies in East German units to major shortcomings in the tactical capabilities of Bulgarian and Romanian units.

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- *Short Terms of Service.* East Germany, Hungary, and Romania have shorter terms of active service for conscripts than the other Pact countries. As a result, East German and Hungarian units typically have one-third and Romanian units one-half of their conscripts untrained at any point, whereas Soviet and other NSWP units have roughly one-quarter of their conscripts undergoing their initial training.

- *Longer Mobilization Times.* The increasing dependence on reservists in most NSWP ground units will increase the time required to prepare for war and the need for training after mobilization to prepare for offensive operations.

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- *Lower Reliability.* The commitment of the NSWP ground forces to Pact goals in a war with NATO probably would vary but undoubtedly would be lower than that of Soviet units. As a result, most NSWP units probably would be less capable of sustaining major losses than their Soviet counterparts.

Implications and Prospects

Slow progress on the overall Pact goals for modernization is likely for the rest of this decade. East German and some Hungarian and Czechoslovak ground divisions probably will meet the Pact's current goals by the late 1980s; however, Polish, Bulgarian, and Romanian ground units probably will improve only in the most critical areas. In contrast to the other NSWP countries, Poland, Bulgaria, and Romania have large inventories of obsolescent equipment in virtually all units and categories of weapons. Without major improvement in economic performance, these countries could not afford the massive increases in military procurement needed to modernize their ground forces in all categories of weapons before the mid-1990s.

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The increasing disparity in the NSWP ground forces will make it difficult for the Soviets to maintain common standards of training and increase mobility and firepower throughout the Pact. In particular, the shortcomings in these forces will inhibit their capabilities to adopt the new Soviet tactics to counter the proliferation of antitank weapons and modern tactical aircraft in NATO. Since the mid-1970s the Soviets have expanded their ground forces in Eastern Europe and the western USSR, increased firepower and air defenses within these units, and tested new tactics, such as the integration of air and ground-firepower and the use of helicopters. These tactics are beyond the capabilities of most of the NSWP ground divisions as currently organized and equipped.

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The differences in capabilities between allied forces in a joint front would also reduce the effectiveness of Pact operations. The weaker NSWP ground forces would be:

- Less capable of executing Pact tactics for breakthrough and exploitation during an attack.
- Less capable of protecting the front's flanks.
- More vulnerable to airstrikes and counterattacks.

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The Soviets probably calculate that in joint-force operations the strengths of the better equipped forces—which are usually Soviet—will offset the deficiencies of the weaker allies. Nonetheless, the more poorly equipped force in a joint operation would present potential vulnerabilities to counterattacking NATO forces and, at the very least, would slow the pace and momentum of the attack achieved by the stronger forces. In the worst cases we have identified the Soviets might need to use some of their own units to reinforce those of less adequate and/or less reliable allies, thus diverting some of their own second-echelon forces to frontline duty.

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Soviet and East European Air Forces: Comparisons in Combat Potential

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Analysis of trends in the strength and composition of Warsaw Pact air forces opposite NATO reveals a growing disparity between the overall Soviet and East European air forces in terms of combat potential. Only in ground attack capability have the non-Soviet Warsaw Pact (NSWP) air forces shown substantial improvement in recent years. Even this is due mainly to an increase in aircraft numbers rather than to the deployment of more modern aircraft.

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Strength of Forces

The NSWP air forces have a combined strength of about 2,400 fixed-wing combat aircraft—36 percent of the 6,600 combat aircraft opposite NATO.[1]

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Force Modernization

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The recent large increases in the potential of Soviet aircraft reflect the large-scale deployment of late-model aircraft. As of mid-1983, 80 percent of the aircraft in the Soviet forces but only about 40 percent of those in the NSWP forces were models introduced since about 1970. Aircraft introduced prior to about

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1960 have almost disappeared from active service in Soviet combat units but still constitute more than 20 percent of the NSWP forces.

Mission Contrasts

The traditional role of the NSWP air forces has been air defense. In 1983 about 1,600 of their aircraft were air defense fighters. Although this represents a decline of about 200 since 1970, fighters still constitute nearly two-thirds of the total NSWP fixed-wing combat force. By contrast, only 40 percent of the Soviet aircraft opposite NATO in 1983 were fighters (figure 2)

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While NSWP fighter strength has decreased, the number of aircraft with a ground attack role has grown. In 1983 about 640 aircraft were in NSWP ground attack units—an increase of 180, or 40 percent, over the number 10 years earlier. Nearly half this increase resulted from the establishment of a ground attack force in Romania, which now has 80 aircraft—about 25 percent of its air force—assigned this role.

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The growth in the NSWP ground attack forces has paralleled a similar trend in the Soviet forces opposite NATO. Since 1970 the number of aircraft in Soviet fighter-bomber units has increased nearly 25 percent to more than 2,000, while there has been little growth in the number of aircraft assigned to defensive units. The increases in ground attack aircraft reflect Soviet stress on the need to provide air support to conventional operations and to achieve air supremacy by attacks on airfields. East European air forces probably were first included in Pact plans for such operations in the early 1970s.

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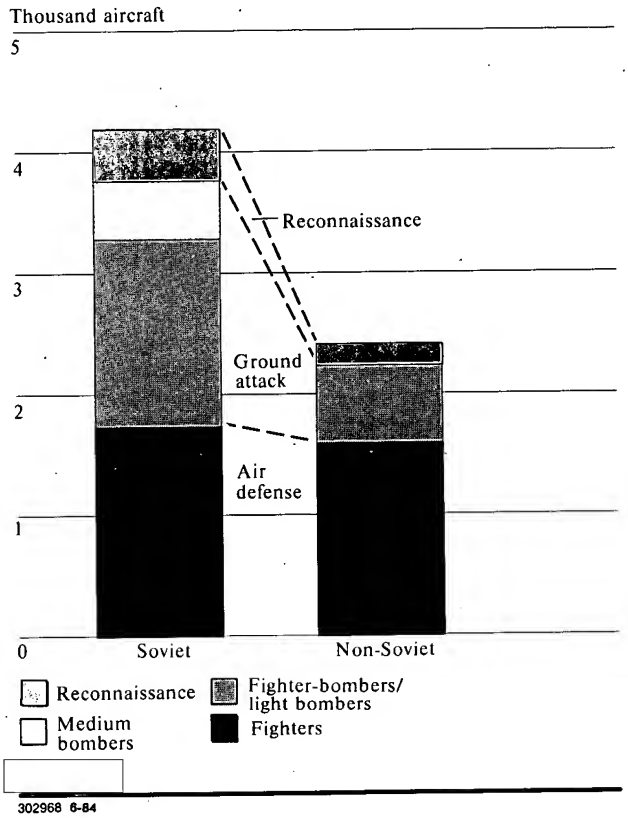
Despite the increased emphasis on ground attack, however, half the NSWP ground attack forces still consist of pre-1960 aircraft. Trends in aggregate combat potential, while indicating substantial growth in force effectiveness, are due primarily to the increase in the number of NSWP aircraft in a ground attack role rather than to improved aircraft capability. Recent deliveries of new aircraft have increased the capability of NSWP ground attack forces, but the large number of older aircraft with low combat potential scores gives these forces

Figure 2
Mission Emphasis of Soviet and Non-Soviet Warsaw Pact Air Forces, 1983



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approximately equal to that of the Soviet ground attack forces in the early 1970s

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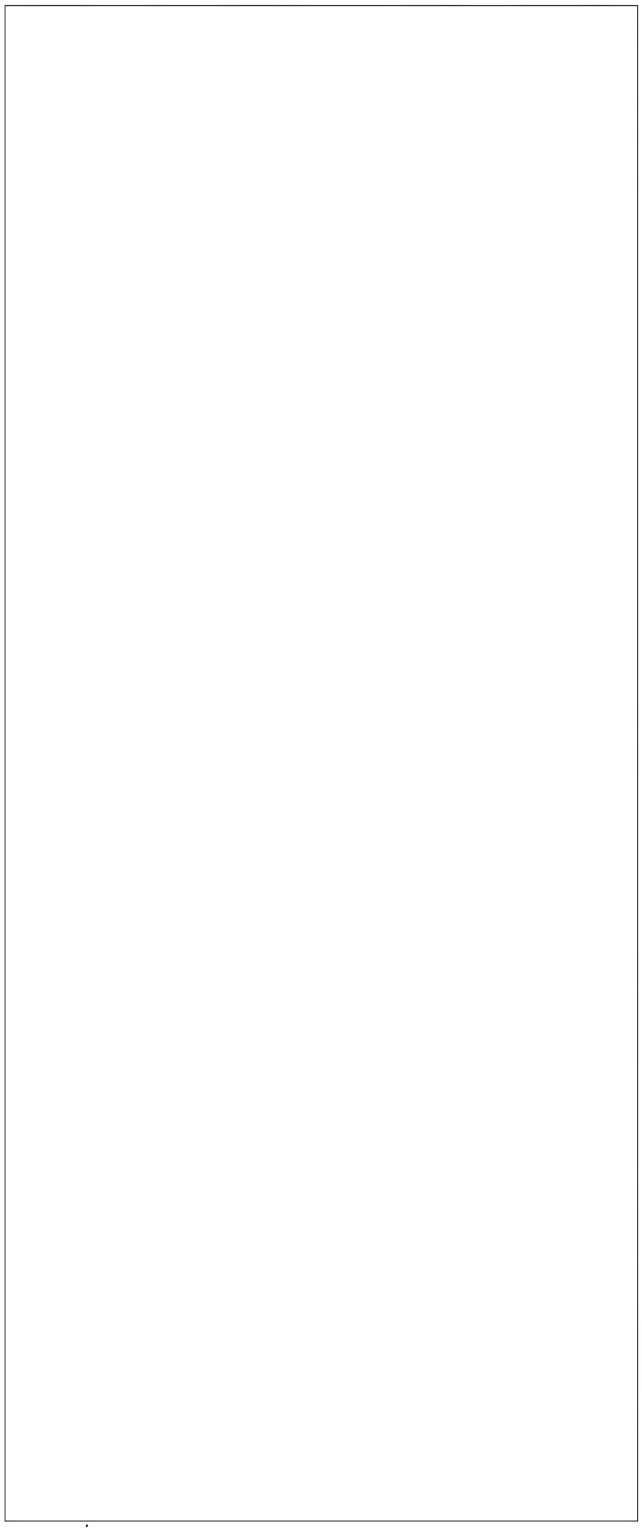

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Soviets a strong argument in pressing their allies to make larger expenditures for new aircraft. For economic reasons, however, the East Europeans probably will continue to resist such pressures. Moreover, the NSWP forces have a large number of recently manufactured variants of older, less capable aircraft—which have a useful life well into the 1990s—and this will prevent them from making major purchases of new aircraft in the near term. 25X1

We expect the NSWP air forces to remain at about their present numerical strengths through the end of the decade, with only marginal improvement in combat effectiveness. Consequently, we expect the gap in relative combat potential between the non-Soviet forces and those of the Soviet Union will continue to widen as the Soviets deploy large numbers of more modern aircraft into their own units opposite NATO. 25X1

The relative weakness of the NSWP air forces probably raises doubts among Soviet planners about their allies' capability to support wartime operations in the Western Theater. Pact planning calls for NSWP forces to play a major air defense role and to support the advance of ground forces into Western Europe, particularly the Polish and Czech-Soviet fronts. Failure of the NSWP national forces to provide adequate support in these areas, where Soviet forces are relatively weak, could compromise Pact operations throughout the theater. 25X1

If the Soviets cannot induce the more important Pact members to undertake a substantial modernization of their air forces, they may be forced to provide aircraft at subsidized prices—which they have been reluctant to do in the past—or increase their own military presence in Eastern Europe. Either alternative would increase the cost to the Soviets of Warsaw Pact defenses. An expanded Soviet presence also could have political repercussions and might erode support by the East Europeans for Pact objectives. 25X1

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Implications

The wide differences in combat potential between the NSWP and Soviet air forces opposite NATO give the

Other Topics

The Soviet Cement Industry: Problems and Prospects [redacted] 25X1

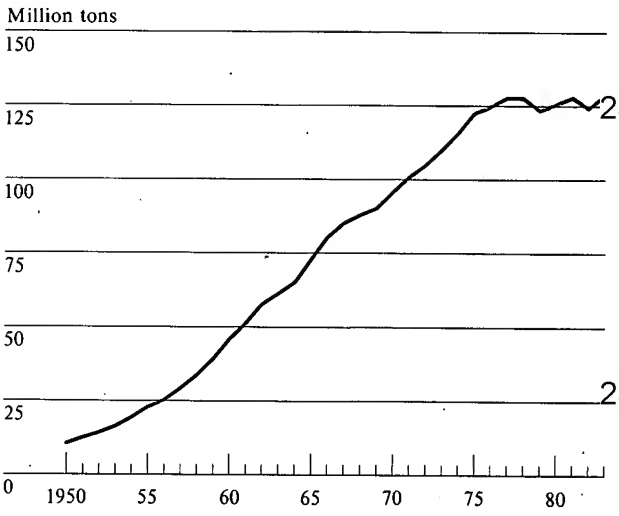
The USSR's emergence as the world's largest cement producer stems from several decades of emphasis on massive new construction in support of both civilian and defense programs. To conserve scarce and more expensive ferrous and nonferrous metals, cement is used where feasible in construction. In addition, short construction seasons encourage factory prefabrication of components, for which cement is suitable. [redacted]

Despite this industry's importance to investment activity, it has experienced the same growth slowdown that has occurred in most of the other Soviet industries. Growth virtually halted from 1976 to 1982, averaging only 0.3 percent per year (figure 1). Output declined by 3 percent in 1979 and again in 1982. The increase of about 3 percent in 1983 did little more than recoup the decline in 1982. [redacted]

Raw Material Constraints

Dwindling supplies of raw materials—including quarry minerals, industrial byproducts, and special additives—and a deterioration in their quality have been the principal causes of the slowdown in the cement industry. Because cement technology offers few opportunities for reducing material intensity, it is difficult to expand production without nearly proportional increases in raw material supplies. As with other extractive industries, Soviet planners have neglected to develop new raw material deposits. The use of quarry materials has outstripped the development of new deposits, creating a bottleneck. In selecting sites for new plants, the planners frequently have failed to provide for sufficient mineral reserves. This problem

Figure 1
USSR: Cement Production, 1950-83



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is compounded by the Soviet practice of expanding the size of existing plants, thereby depleting quarry reserves more quickly. [redacted] 25X1

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Industrial byproducts are a potential substitute for some quarry materials, but they cannot be used to produce the high-grade cements in growing demand. The slag of the ferrous metals industry, waste products of the nonferrous metals industries, and the fly ash of electric power plants can be used in cement production. In fact, 17 cement plants are located near steel plants for this purpose, and most new plants are being located similarly. However, shortfalls in metals production in the last few years and the decline in the importance of coal as a source for generating electric power have limited the availability of these raw materials.

Erratic Energy Deliveries

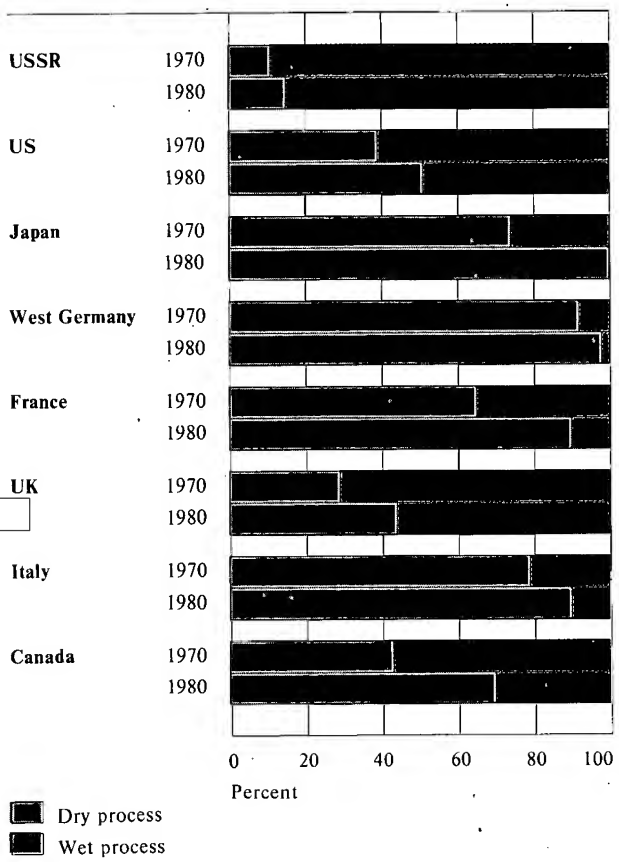
Cement production is one of the most energy-intensive activities in the USSR. Interruptions in deliveries of fuel and electric power—especially during winter—have had a severe impact on the cement industry, shortening equipment life, increasing consumption of refractory materials, and reducing fuel efficiency.

Fuel efficiency growth slowed a few years before the output slowdown. Historically, improvements in fuel efficiency in this industry had been obtained by shifting from coal to gas and oil. The gains would have been larger if a simultaneous program to upgrade product quality had not required more energy-intensive production.

Future gains in energy efficiency depend primarily on greater use of the dry process of production.[1] Unlike the industrialized West, which dramatically increased its use of the dry process when faced with sharp increases in energy prices in the 1970s (figure 2), the USSR has made a slow transition to this process. The share of this more energy-efficient process in total Soviet cement capacity has increased by only 4 percentage points, from 11 to 15 percent, in 20 years. Soviet raw materials are not as well suited to the dry process, but the main reasons for the slow transition are constraints on investment and technological difficulties. Furthermore, conversion of existing plants requires a lengthy unproductive period, which places already scarce cement in even tighter supply.

[1] The main difference between the wet and dry processes for producing cement is the moisture content of the raw materials as they pass through the kiln. The dry process is more energy efficient, using about one-third less fuel than the wet process. The wet process is the older technology, but has an advantage of less stringent requirements regarding the quality of raw materials.

Figure 2
Shares of Total Cement Production by Process, 1970 and 1980



Decline in Capital Productivity

A decline in capital productivity has hurt output growth. Investment has been unbalanced—focusing on large rotary kilns—and has led to bottlenecks elsewhere. Moreover, the priority devoted to kiln construction has hindered development of machinery that could automate production and stabilize product quality. Another problem is the obsolescence of the industry's capital stock. A large portion of the plant and machinery was commissioned during the postwar building boom of the 1950s and is nearing the end of its productive life. Because this equipment remains in use, productivity drops while repair costs and downtime mount.

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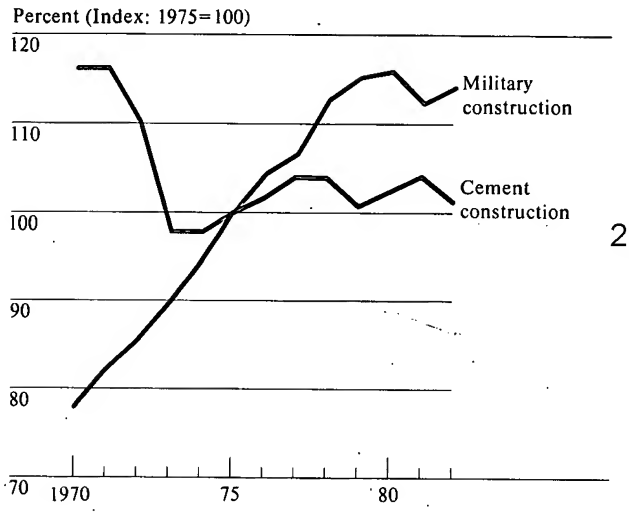
Labor Shortages

Cement production is considerably more labor intensive in the USSR than in other industrialized countries, because the Soviets have failed to mechanize auxiliary work, intraplant and extraplant transport, materials handling, maintenance, and repair. The cement industry—like most of the economy—is suffering from shortages of labor, especially skilled workers, and excessive labor turnover. These shortages have most severely affected repair work; inadequate repair has been cited as the main reason that plants have operated below capacity in recent years.

The number of repair workers has increased in recent years, but not enough to allow for new capacity and the growing repair requirements of older machines. When combined with shortages of spare parts, the lack of repair workers has prolonged downtime and increased the frequency of machine-damaging accidents. To compensate for labor shortages elsewhere in the plant, managers have diverted their repair workers to other tasks and have subcontracted repair work with centralized repair trusts despite the reputation of these trusts for notoriously poor and slow service.

Figure 3
Trends in Cement Production and Military Construction, 1970-82



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Slow Technical Progress

Research and development have been pursued in an uncoordinated fashion, as in most Soviet industries. For example, research on concrete and cement is performed by different organizations—the equivalent of studying bread while ignoring flour. Also, some pilot plants develop new types of cement with little or no consideration of their commercial application. No institutions exist to bridge this gap between research and application. Quick-hardening cements introduced 10 years ago are still produced in negligible quantities. Although new dry-process techniques were worked out in the late 1960s, only one plant had successfully introduced these techniques by 1982.

Changing Composition of Demand

The demand for special types of cement that are difficult to produce has grown in recent years and has limited growth in overall cement output. In particular, increased requirements by the defense, nuclear power, and oil and gas industries have contributed to this problem. The defense sector is a major consumer of high-strength cements for missile silos, silo cores, and many other projects. The growth of military construction has exceeded the growth of cement production in recent years (figure 3), increasing the burden on the industry. To satisfy these demands, cement producers in some cases have had to reduce their overall output.

The nuclear power industry uses high-quality cement to build containment buildings and other heavy-duty structures at nuclear plants. Special polymer cements are particularly important to reduce the possibilities of cracks and leaks, especially where temperatures are low or volatile. Nuclear construction accelerated after 1975; investment in 1976-80 was about two and a half times the level in the previous five years. Meanwhile, the increase in oil prospecting and drilling since the mid-1970s has accelerated the demand for special oil well cements. Periodic shortages of these types of cement have hampered oil and gas exploration.

With demand for high-quality cement by the defense construction, nuclear power, and oil and gas sectors growing more rapidly than total cement production,

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the cement available to other parts of the economy is in tight supply. Moreover, a failure to improve the average quality from 1976 to 1982 suggests the residual users have had to cope with lower quality cement.

Prospects

Official statements by Soviet planners suggest the following policies will be used to relieve the strains on this industry:

- Energy savings will be obtained by promoting conversion to more energy-efficient production techniques and attempting to discover new types of cement. There will be a campaign to promote the use of industrial byproducts, even though this will lower the quality.
- Raw material supplies are to be increased by providing more investment to open new quarries and expand old ones and by seeking to share quarries with other industries.
- Investment funds will be spent to modernize plant and equipment and to build new, technologically advanced facilities.
- Labor productivity is to be raised by mechanizing repair work, transport loading and unloading, and materials handling. More funds are to be spent to provide amenities for workers to induce them to remain on the job.

Completing these tasks would require a large investment program, but Soviet planners have allocated only 1 billion rubles of investment to the cement industry in the 1981-85 five-year plan. Sharing limited funds among many projects is likely to reduce the effectiveness of this investment.

Foreign trade is not a feasible alternative. Importing raw materials for cement production, or cement itself, is too costly and strains the transportation system. Moreover, East European countries, the logical suppliers, probably do not have the surplus capacity to provide these materials. Therefore, cement production will probably not return to earlier growth trends, and output may decrease in some years, especially when winters are severe.

This slow growth of production will constrain the nation's ability to accelerate new construction. Cement and concrete products account for about one-fifth of material inputs to construction. With possible substitute materials also in short supply, the importance of cement is unlikely to decrease. If the demand for hard-to-produce specialty cements by the defense, nuclear power, and oil and gas industries continues to grow, the burden of reduced growth will fall more heavily on other users of cement.

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The Grain Crop: Foreign Exchange and Morale Implications 25X1

This year's grain crop is likely to lead to grain imports larger than those of calendar year 1983 and could jeopardize the Soviets' effort to match last year's record meat production.[1] Even so, upward pressure on world grain prices will probably be slight, unless the US or Canadian harvest is unusually poor.

The meat program has been the centerpiece of the Soviet consumer program since the mid-1960s, and improvement of supplies is an integral part of the high-priority Food Program promulgated by Brezhnev in May 1982. But any estimate made in June of meat production for the year can only be tentative. The effect of weather on grain and nongrain feed crops and the volume of animal feed needed will be the key variables, although a number of other factors come into play. As in the past, grain imports can help offset the vagaries of the weather. It is already clear, however, that this year's crop will fall considerably below the 1978 record harvest of 237 million metric tons (mmt). A harvest better than last year's is possible, but the downside risk is increasing.

Even in poor harvest years the Soviet Union produces more than enough grain to meet its people's needs for bread and other grain products. The problem is to also grow enough feed to maintain livestock herds and thereby expand meat production. The recent run of bad weather has presumably raised concerns about future meat supplies and may have caused the flurry of new grain purchases in recent weeks. If the crop is sharply reduced, the Soviet leaders will have to decide whether to incur the additional hard currency cost of larger grain imports or to accept an increase in consumer dissatisfaction.

Good Weather

The Soviets will need much better-than-average weather for the rest of the 1984 crop season to even approach the 205-mmt annual average harvest of the 1976-80 period. With a crop of this size, and, should nongrain feed supplies approach last year's estimated high level, past experience suggests the Soviets would still need to import nearly 40 mmt of grain this calendar year—5 mmt more than last year—to increase meat production modestly over last year's record level of 16 mmt. 25X1 25X1

Moscow needs a growth in meat supplies of 1 to 2 percent per capita to keep shopper queues from increasing substantially and to hold meat prices in free markets relatively stable for a second year. (During 1979-82, consumers endured lengthening queues, the spread of informal rationing, and surges in free market prices.) Even so, it would take several years of marked growth in meat supplies to diminish effectively the pent-up demand caused by the stagnation in per capita meat supplies during 1975-82, when disposable money incomes were growing. 25X1 25X1

Average Weather

This is both more likely and less favorable for the Soviets. With another crop like last year's—estimated at 195 mmt, about 10 mmt less than the 1976-80

USSR: Linkages in the Feed Supply–Grain Imports–Meat Production Cycle

To get some growth in meat production in 1984, a smaller supply of grain and nongrain feeds need not be offset by increased grain imports on a 1 to 1 basis, because: 25X1

- *The major impact of one year's grain crop is on the next year's feed availability.*
- *Some shifting of feed from nonmeat to meat products could occur.*
- *Nongrain feeds, which account for two-thirds of total livestock feed, vary somewhat with the grain crop, but are generally less volatile.* 25X1

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[1] See brief "Soviet Grain Crop Outlook." 25X1

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average—the Soviets would have to import at least 45 mmt to achieve the same modest growth in meat output. To import this much grain by the end of the year, however, would require a level of imports during July-December that might exceed the capacity of the Soviet port and rail system.

Past monthly trade data show that the Soviet ports and rail system can transport at least 50 mmt of imported grain annually. As only 15 mmt had been shipped through May, 45 mmt is probably the absolute upper limit that could be imported by year's end.

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Bad Weather

The transportation constraint on import capacity indicates that, if the grain crop falls much below 1982's poor performance (estimated at about 180 mmt) and the supply of nongrain feed also declines, Moscow probably will be physically unable to import enough grain to achieve any growth in domestic meat production. Under such circumstances, meat output, at best, would remain around the 16-mmt level posted last year; a reduction in herd size would be the primary way to raise meat production.

The Soviets would be unlikely to reduce herds sharply, however, unless the harvest were disastrous—on a par with the 140-mmt crop in 1975. They have invested heavily in rebuilding herds since the marked reduction in 1975 and understand fully the problems involved. They would see the consumer dissatisfaction problem and the price pressure difficulty as less damaging in terms of domestic stability than excessive slaughtering. The rise in consumer frustration would probably be manageable.

Impact Upon World Grain Prices

Should the Soviets decide to import up to 45 mmt of grain, they probably would have little trouble acquiring this amount, in light of current projections of record world grain production. If the stepped-up tempo in monthly deliveries to the USSR—which is likely in the last half of this year—were continued for the balance of the 1984-85 marketing year (1 July–30 June), imports for that period would be over 50 mmt. Record wheat stocks and bumper crops expected in the West probably would offset most of any upward pressure on prices caused by the larger Soviet purchases. However, unfavorable weather in the USSR and another major growing region (especially the United States or Canada) and heavy Soviet grain buying—especially of US corn—could push up prices substantially over the next six to 12 months.

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USSR: Some Scenarios for the Calendar Year 1984 Feed Supply–Grain Imports–Meat Production Cycle

Possible 1984 Grain Crop	Consequences	
	In Meat Output	In Import Requirements
Around the 1976-80 average (205 mmt)	2 to 3 percent over 1983	Near 40 mmt—about 5 mmt more than 1983
Like the estimated 1983 crop (195 mmt)	2 to 3 percent over 1983	At least 45 mmt—upper limit for imports for 1984
Like the estimated 1982 crop (180 mmt)	No better than 1983	45 mmt—upper limit for imports for 1984

Note: The supply of nongrain feed is assumed to be, at best, a little below the 1983 estimated high level. It is also assumed to vary somewhat with the size of the grain crop.

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the USSR has bought as much as 7.5 mmt of grain from Canada, Argentina, and the European Community in recent weeks and is negotiating for 1.2 mmt of US wheat and 300,000 to 500,000 tons of US corn. Deteriorating crop prospects may have prompted these initiatives. Grain imports in calendar year 1983 cost Moscow an estimated $5 billion in hard currency and accounted for almost 20 percent of all Soviet hard currency imports. Grain imports of 45 mmt in 1984 would raise the grain bill by over $1.5 billion.

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Briefs

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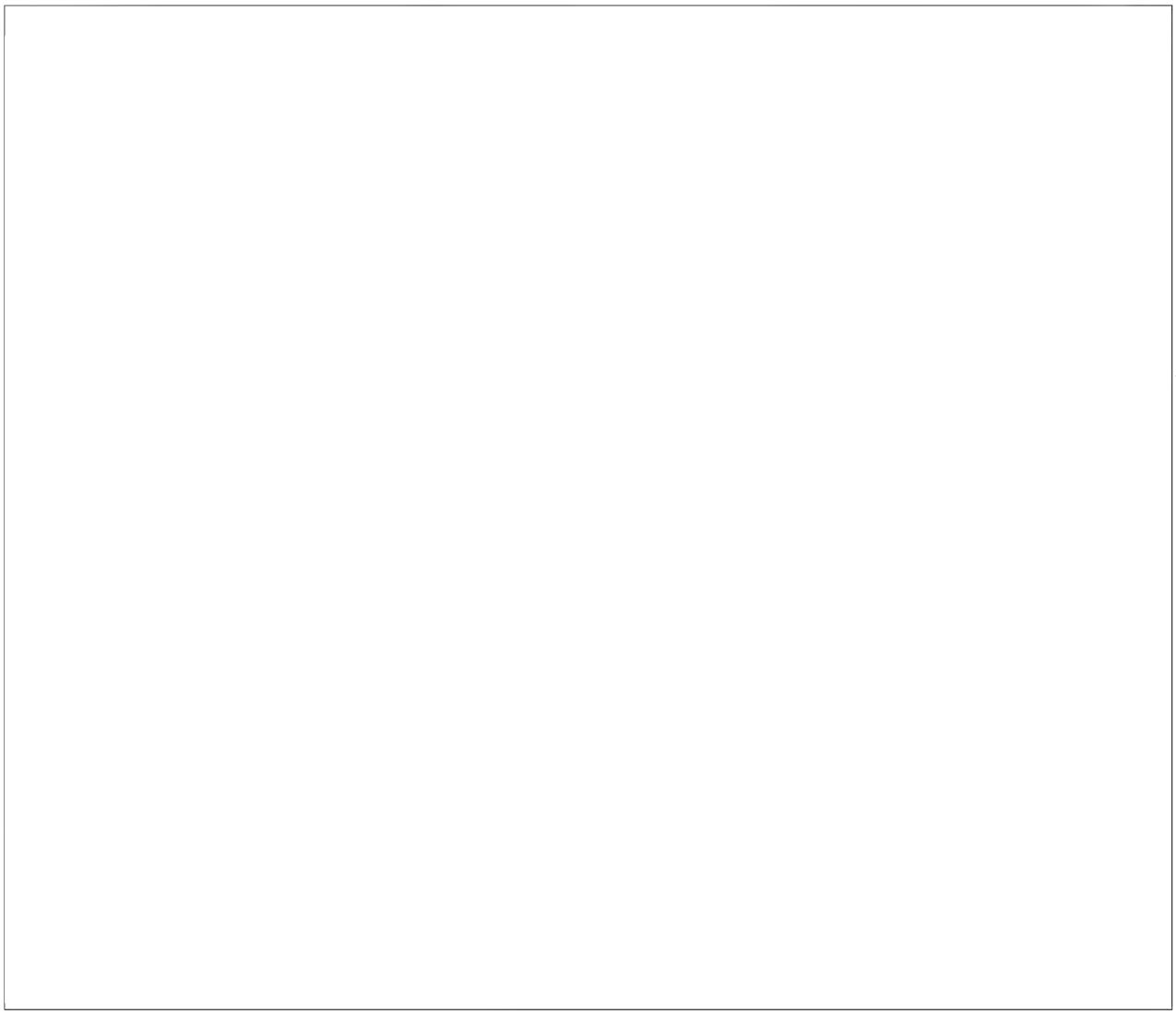

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Soviets Dismiss Western MBFR Proposal

The Soviet Ambassador to the MBFR talks recently criticized the new Western proposal for making reductions of forces to parity levels contingent on East-West agreement on data about existing forces and for introducing additional categories of data exchange. After the Ambassador made these remarks in a plenary session, a Soviet press spokesman in Vienna announced publicly that the East had "turned down" the Western proposal.

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The Soviets recognize that some NATO allies view the data issue as a fundamental barrier to progress in the talks, and they probably hope that their strong negative reaction will lead some allies—particularly West Germany, which endorsed the latest Western initiative reluctantly—to push for a more flexible NATO position on the data issue. The Eastern position in MBFR is that agreement on reductions should be reached without agreement on data.

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In private, Soviet representatives have said that they see little prospect for movement in MBFR until after the US elections but that "events" may permit progress at some later point. They have indicated that their near-term strategy will be to dismiss the Western proposal as not constituting a satisfactory response to the 1983 Eastern proposals.

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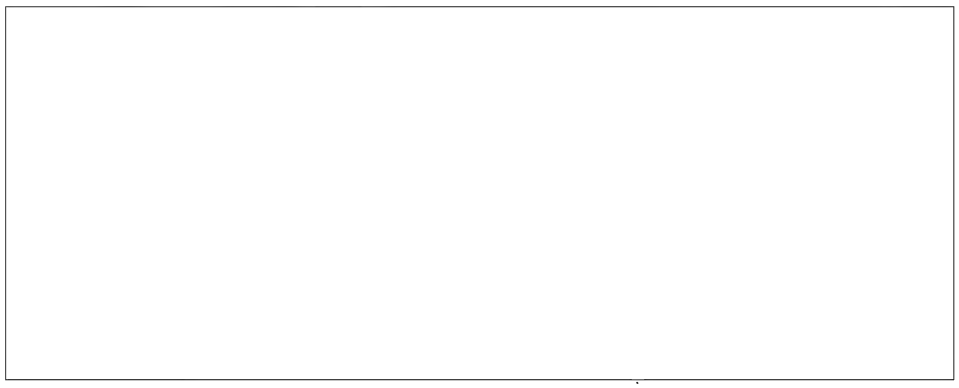

Soviet-Jordanian Arms Negotiations

Senior Jordanian officials have been hinting in public that Amman is planning to expand its arms relationship with Moscow. 25X1

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In late 1981 Jordan purchased SA-8 surface-to-surface missiles and ZSU-23/4 self-propelled artillery from the USSR—its first acquisition of Soviet weaponry. Since then, Moscow has sent approximately 25 military advisers to Jordan to train the Jordanian military on the use of the weapons, and a small number of Jordanians have undergone training in the USSR. The Jordanian Government, wary of Soviet intentions, has kept the arms relationship limited. Although unhappiness with US policy apparently has convinced the Jordanians to purchase additional Soviet weapons, they are likely to maintain limits on the military relationship with Moscow. 25X1

USSR Ends Legal Minicomputer Imports

A Soviet decision to discontinue legal imports of minicomputers from the West is unlikely to lead to any reduction in efforts to acquire advanced Western minicomputers through illegal channels. The State Committee for Supply has informed Soviet institutions that they no longer will be permitted to purchase Western minicomputers, according to sources of the US Embassy in Moscow. The new Soviet policy will not have any appreciable impact on minicomputer imports from the West, however, which declined dramatically after the United States imposed strict controls following the Soviet invasion of Afghanistan. Soviet purchases fell from more than $50 million in 1979 to about $5 million in 1982. 25X1

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Soviet-made minicomputers are significantly inferior to their Western counterparts, and Soviet customers tended to resist using them as long as Western equipment was available. For higher priority military research and development applications where more capability, versatility, and reliability are crucial, the Soviets can be expected to try to acquire export-controlled US minicomputers illegally. 25X1

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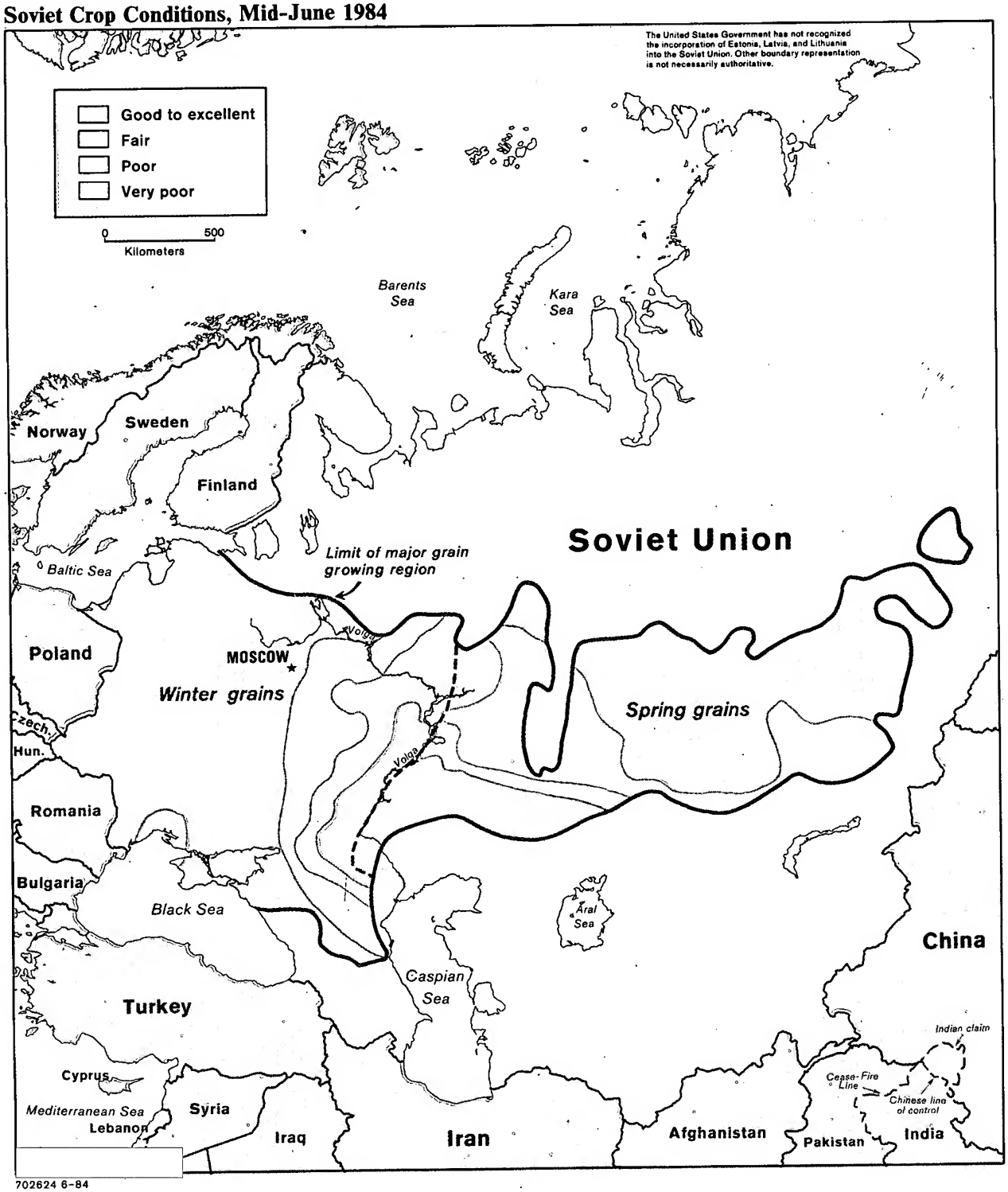
Soviet Crop Conditions, Mid-June 1984



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Soviet Grain Crop Outlook [redacted]

Drought in the lower and middle Volga Valley and parts of the Central Black Earth, North Caucasus, Volga Vyatka, and western Kazakhstan regions has greatly reduced Moscow's chances for a grain crop as large as the 205-million-ton average produced during 1976-80. However, moisture is adequate in other major grain-growing areas. We believe that Western press predictions of another disastrous crop shortfall for the country as a whole are premature. The high-pressure ridge that intensified the drought has dissipated, and the affected area received widespread rain during the third week of June. [redacted] 25X1 25X1

In our judgment, most of the winter and spring grain production in the lower Volga Valley (about 5 million tons in an average year) has been lost. Much of the damage done by the drought to grains in the remainder of the affected area is irreversible, but it will be several weeks before we can accurately assess the extent of that loss. On the other hand, prospects for about two-thirds of the crop—particularly in the Ukraine and much of Kazakhstan—have improved in recent weeks. We continue to believe that a grain crop as high as 200 million tons is possible if ideal growing conditions prevail through the summer. [redacted] 25X1

Soviet Educators To Get Pay Raise [redacted]

A decree issued in late May will raise wages and bonuses for teachers and other education workers by 30 to 35 percent over the next few years. Teachers in grades one through four and boarding school workers will receive pay boosts on 1 September. Increases for the rest of the education work force will be phased in over several years, starting in the northern and eastern regions of the USSR. The pay hikes are one of several steps taken under last April's educational reforms to attract more and better people into teaching, particularly for primary grades, at the secondary vocational level, and in rural areas. Teachers are among the lowest paid workers in the USSR and received their last pay raise in 1975. Low pay and lack of prestige have kept the number of applicants to teachers' colleges low; since 1970 the number of teachers in grades one to 10 has declined. [redacted] 25X1 25X1

USSR Continues To Limit Hard Currency Trade [redacted]

Data for Japan and West Germany, two of the USSR's major trading partners, indicate that Soviet imports of Western equipment and semimanufactures were lower in the first quarter of 1984 than in first quarter 1983. This decline in technology trade continues a trend begun in 1976, when the USSR—concerned over a rapidly rising debt caused by a surge in machinery and equipment purchases—began to limit its imports from the West. Although real hard currency imports of machinery and equipment rose sharply in 1982-83 (reflecting Soviet orders for the Siberia–to–Western Europe natural gas pipeline), they did not fully recover from the 40-percent drop in 1977-81. The volume of large-diameter pipe imports—which stagnated in 1977-81—also rose in 1982 but has since declined. Real Soviet hard currency imports of nontubular steel, chemicals, and manufactured consumer goods have stagnated or declined over the past eight years. [redacted] 25X1 25X1

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Moscow is expected to continue its attempt to hold the line on hard currency imports. The foreign trade plan for 1984 implies an intention to reduce imports from the West. Orders for Western equipment in 1983 were only four-fifths of both the 1982 level and the 1977-82 average, and in the first quarter of 1984 such orders were less than half the first-quarter 1983 level. The USSR probably will continue to rely on the West for development of its energy sector—and, to a much smaller extent, for food-processing equipment—but we believe it is unlikely to boost its imports of Western manufactures and semimanufactures sharply in the near future. The outlook for Soviet exports remains poor, and there are no signs that the USSR intends to alter its conservative approach to borrowing in the West.

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